

This species is known from Britain, Germany, Austria, France, Italy, and North America, whilst the true *Aylax glechomae* (Linn.) is only known from Sweden and Germany.

Aylax minor Htg. and *A. graminis* Cam.

Both these names are instated as good species. Regarded by Cameron as forms of *A. papaveris* and *A. hieracii* respectively.

Penshaw Lodge,
Penshaw, Co. Durham.
August 7th, 1917.

OBSERVATIONS ON BRITISH COCCIDAE; WITH DESCRIPTIONS OF
NEW SPECIES.

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No. III.

The following notes are strictly in continuation of my two previous papers, published in this Magazine (under slightly different titles) in May-June 1915 and Feb. 1916.

Lecanium bituberculatum Targ.

This species was observed, on the 26th March, occurring abundantly on a small section of Hawthorn hedge, in the town of Camberley. White scars showed where many of the insects had been picked off by birds.

Lecanium capreae L.

Dr. Imms has sent me an example of *capreae*, taken upon *Myrica gale*, at Pwllheli, Carnarvon. I have also received the same insect on the common evergreen laurel (*Cerasus laurocerasus*), from Woking, where it was found by Mrs. H. D. Taylor. Both these plants constitute new records for the species.

Lecanium nigrum var. *depressum* Targ.

A *Lecanium*, answering closely to the description of *depressum*, was observed in the Palm House of the Royal Botanic Gardens, Kew, in December of last year (1916). It was especially abundant on the under-surface of the fronds of a species of *Musa*, and occurred more sparingly on *Chrysophyllum*, *Malacantha*, and *Ficus* spp. Though the structural

characters of *depressum* are indistinguishable from those of *nigrum* (of Nietner), I think that the present form deserves varietal rank. In colour it ranges from castaneous to chocolate-brown, with a dull surface—often flecked with white secretion. In form it is oval, slightly narrowed in front, and moderately convex. A slight medio-longitudinal carina can usually be distinguished. Typical *nigrum*, on the other hand, is very strongly convex, of a deep black colour, with a smooth and shining surface.

Lecanium persicae crudum, n. subsp.

In an earlier paper in this Magazine (Feb. 1916) I mentioned the receipt of an unusually flattened form of *L. persicae*, affecting the foliage of *Aralia*. Mr. Scott subsequently sent me fresh living material of this same form, from the same plant. The early adult females exhibit the characteristic black bands described by Newstead for typical *persicae*. Older females are of a pale putty-colour, thinly sprinkled with white powdery secretion. The colour darkens, with age, to castaneous brown; but the scale remains depressed and never becomes so hard and dense as in the type. The females commence ovipositing quite early, while still in a soft pale condition, and the ova are white instead of pinkish. I have been unable to find any structural differences between this form and the type; but it will be convenient to distinguish it, as a subspecies, by the name *crudum*, signifying its "underdone" or "half-baked" appearance.

Lecanium hesperidum L., var.

Dr. Imms has submitted specimens of a *Lecanium* which is "flourishing on an orange plant reared from seed in the botanical laboratory here (Manchester)." The insect is of a clear castaneous colour, slightly mottled with darker brown. It occurs on the under-surface of the foliage. A microscopical examination shows characters identical with those of *L. hesperidum*, to which species I must attach it, although it differs from the ordinary forms in its coloration—more particularly in the absence of the usual dark patch on the venter.

Lecanium signiferum Green.

On *Polypodium aureum*; in one of the plant-houses at the Royal Botanic Gardens, Kew; Dec. 1916.

This species has hitherto been recorded from Ceylon and India only. It is possible that it may be—as suggested by Sanders—a

varietal form of *L. hesperidum*; but, if so, its very characteristic colour-pattern (green or olivaceous, with strongly marked purplish or black longitudinal stripe and two transverse bands) make it deserving of a distinct name.

Lecanium zebrinum, n. sp

Adult female circular or very broadly oval; sometimes transversely ovate: very strongly convex, often approximately hemispherical; usually sloping more gradually on the hinder half of the body; margins of anal cleft upturned. Smooth, or with shallow transverse sulcae; marginal area

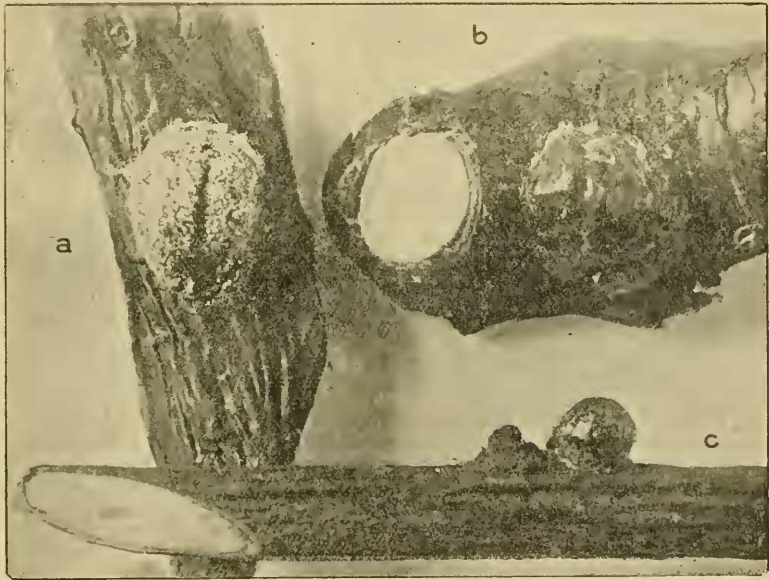


Fig. 1.—*a*, *Lecanium zebrinum*, dorsal view, $\times 4$.
b, " " denuded of secretion, $\times 4$.
c, *Lecanium transvittatum*, side view, $\times 4$.

coarsely punctate. Fresh, living examples have the dorsum almost completely but thinly covered with a greyish-white secretion, leaving exposed a narrow median longitudinal stripe and a curved series of irregular bare patches on each side (see fig. 1, *a*). The secretory covering is of a web-like nature intermixed with powdery matter, giving the insect the appearance of being mildewed. The actual colour of the dorsum (which may be revealed by brushing off the secretion or dissolving it in ether) varies from ochreous, with a narrow medio-longitudinal and broader transverse bands of deep black (see fig. 2, *e, f*), to deep brown, through intermediate shades of castaneous, according to the age of the insect. In the older and darker examples the black markings are correspondingly obscured.

Length of living insect 4.75-7, breadth 4-6 mm.

Antenna (fig. 2, *a*) 8-jointed, 3rd joint longest, 8th next longest, the remainder much shorter; or 7-jointed (fig. 2, *a'*) by confluence of the normal 3rd and 4th joints. There is a pair of unusually long whip-like hairs on each of the 2nd and 5th (or 2nd and 4th) joints. In the 7-jointed form (which may be the result of parasitization) the 3rd joint equals in length the subsequent three together. Mouth-parts large and conspicuous. Legs (fig. 2, *c*) small and slender. There is frequently a fold partially crossing the middle of the femur. In parasitized examples the femur is proportionately shorter and

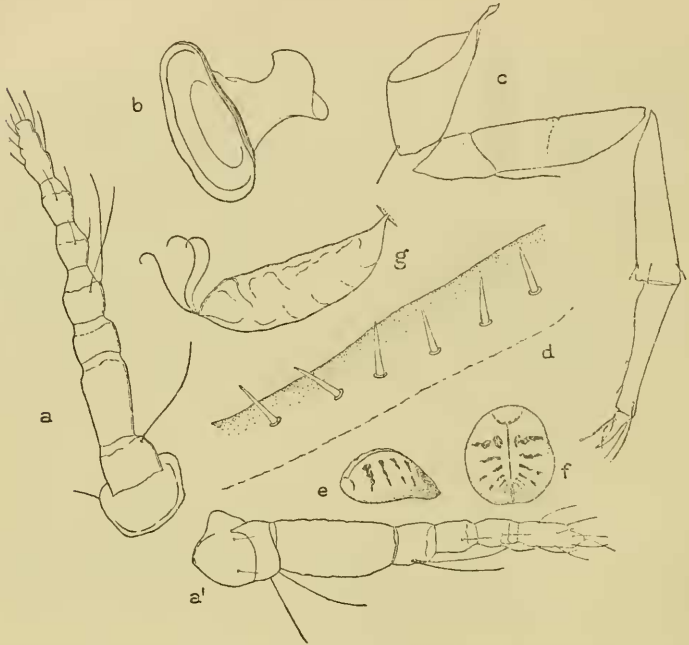


Fig. 2.—*Lecanium zebrinum*: *a*, antenna, 8-jointed, normal form, $\times 176$; *a'*, antenna, 7-jointed form, $\times 176$; *b*, posterior spiracle, $\times 176$; *c*, mid leg, $\times 176$; *d*, marginal spines, $\times 176$; *e*, adult female, side view, $\times 2$; *f*, adult female, dorsal view, $\times 2$; *g*, haltere of adult male, $\times 176$.

stouter. The tibia is conspicuously widened distally, and the tarsus conspicuously thickened proximally; tarsus and claw together as long as the tibia. Claw long and slender; digitules slender, slightly dilated at extremity; the unguals rather stouter than the tarsals. Spiracles comparatively large, especially the posterior pair (fig. 2, *b*), in which the diameter of the external aperture is equal to the length of the tibia of the mid leg. Valves of anal operculum with from 7 to 10 long stout setae on the apical area. Anal ring with 6 stout setae. Derm with scattered circular pores, but without conspicuous dermal cells, except on the denser parts where the pores appear to be enclosed in paler areoles. Margin with a series of acute spines (fig. 2, *d*),

the space between each being about equal to the length of one of the spines. The stigmatic areas are indicated by one or two stouter, shorter, and more obtuse spines.

Male puparium elongate ovate, rather strongly convex; colourless, translucent, glassy. The surface is strongly rugose, but is entirely without the subdivisions which are so conspicuous in the male puparia of many species of *Lecanium*. There is a well-defined rounded median carina upon which is superimposed a series of seven opaque rectangular glassy excrescences, and there are two similar series (making five in all) on each side of the median carina. The margin is closely set with longish cilia and a stout opaque white tuft projects from each stigmatic area.

Length 2, breadth 1 mm.

Adult male with head and thorax (which is unusually ample) of a very dark brownish castaneous colour; the abdomen rather more reddish; legs and antennae paler. The wings are ample, translucent whitish; the costal nervure orange-red; the costal area tinged with reddish yellow. There are eight large prominent black ocelli, four of which are on the under surface, two on the upper surface, the remaining pair having a lateral position. The minute rudimentary eyes are situated laterally, on the genae. Antennae 10-jointed, with three knobbed hairs on the apical joint. Halteres with three long stout hooked setae at the distal extremity (fig. 2, *g*). Caudal extremity with a pair of long opaque white filaments. Sheath of penis slender, acute, approximately three-quarters the length of the abdomen.

Length, from frons to extremity of genital sheath, 1.75 mm. Wing expanse 4 mm.

Hab.: On the branches and young stems of Birch (*Betula alba*); more commonly on sapling plants; also on sapling Aspens (*Populus tremula*). Camberley: May, June. The adult male that was under observation emerged on June 2nd. Young larvae were escaping from beneath the scales on June 22nd.

The female insects are extensively parasitized by two different species of Chalcids. The old dead scales are frequently found to be perforated with seven or eight exit-holes; but this extensive parasitization does not prevent the production of larvae.

The species is very closely related to *L. ciliatum* of Douglas, which occurs on oak. In fact, the microscopical characters are almost identical; but no one could see the two species, side by side, and fail to separate them. They are completely dissimilar in external appearance. *L. zebrinum* is a more strongly convex insect; it has no conspicuous marginal cilia: living examples are distinctly banded with black, and the secretory covering is disposed in a different manner. The only constant difference in the microscopical characters that I have been able to detect is in the antenna, the terminal joint of which is always considerably longer than

the preceding joint; while, in *ciliatum*, the 8th joint is seldom longer (and often shorter) than the 7th.

There is, however, a well-marked difference in the male puparia of the two species. That of *ciliatum* has a well-defined median area surrounded by a raised border (the so-called "corona"), and there are transverse ridges demarking an anterior and a posterior area. The male puparium of *zebrinum* is without any indication of these subdivisions.

Lecanium transcittatum, n. sp.

Adult female (fig. 1, *c*) very strongly convex; hemispherical or even sub-globular, the sides overhanging the margin which is itself slightly out-turned;

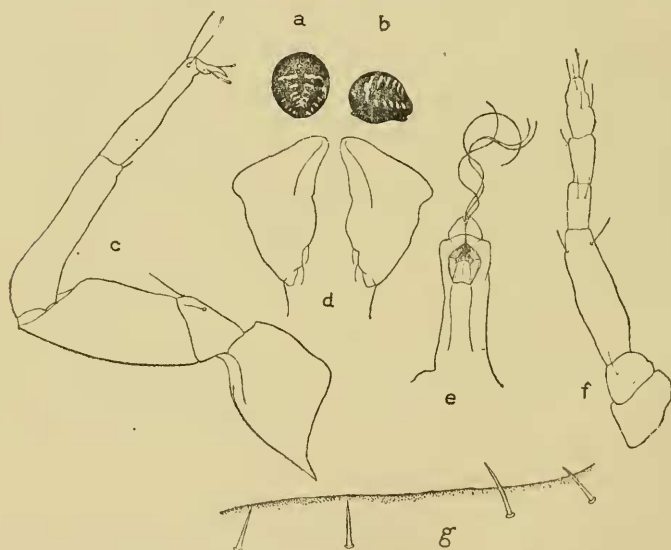


Fig. 3.—*Lecanium transcittatum*: *a*, adult female, $\times 2.4$; *b*, adult female, side view, $\times 2.4$; *c*, mid leg, $\times 176$; *d*, anal operculum, $\times 108$; *e*, rostrum and mouth-parts, $\times 24$; *f*, antenna, $\times 176$; *g*, marginal spines, $\times 176$.

margins of anal cleft strongly upturned. In coloration it approaches some forms of the early adult of *L. capreae*, having ivory-white bands upon a dark particoloured ground (see fig. 3, *a*, *b*) which varies from ochreous-brown in parts, through shades of castaneous to deep blackish brown. The white bands, of which there are five or six, are interrupted on the median line, except on the posterior abdominal segments, where they are continuous; and all but the first band are interrupted again on each side; the first band is the broadest and has irregularly sinuous edges. The colour-pattern fades out and becomes almost obliterated after the death of the insect. Surface smooth and

shining, with one or two small groups of impressed spots on each side of the mesothoracic area.

Dimensions of three living examples, in millimetres:— $3 \times 2.9 \times 2.5$, $3.25 \times 3 \times 2.5$, $4 \times 3.75 \times 2.5$ (the third measurement, in each case, representing the height of the insect).

Antenna (fig. 3, *f*) 6-jointed; the 3rd joint longest, almost equalling the length of the terminal three joints together; 6th joint next longest, but not greatly exceeding the 4th or 5th, which are subequal. The mouth-parts, owing to collapse of the ventral tissues after oviposition, are placed on the summit of an elongate rostrum (fig. 3, *e*). Limbs comparatively small, the anterior pair smaller and relatively stouter than the other two; in the mid leg (fig. 3, *c*) the proximal end of the tibia is rather conspicuously swollen, and the tarsus is slightly more than three-quarters the length of the tibia. Claw long and falcate; digitules slender, the unguals stouter than the tarsals, slightly dilated at extremity. Valves of anal operculum (fig. 3, *d*) roughly triangular, the base shorter than the inner and outer edges, the inner edge strongly sinuous. Margin with slender, acutely pointed spines, spaced at distances of from two to three times their own length (see fig. 3, *g*). Stigmatic areas rather sharply indented; stigmatic spines indistinguishable from those of the general margin. Spiracles with broadly dilated exterior orifice. Derm without conspicuous cells, except on the marginal area where there are scattered oval paler areoles. The derm immediately surrounding the anal orifice and extending for some distance on each side of the anal cleft is more densely chitinous and thrown into folds, which form a delicate tracery of sinuous lines, suggestive of the pattern of a human finger-print.

It should be noted that the description of the structural parts is drawn up from a preparation of a single example, and may possibly require modification when more abundant material is available.

On Birch (*Betula alba*); Camberley: June 1917. The species appears to be extremely scarce, many hours of diligent search having resulted in the discovery of four examples only, which were, in each case, completely isolated on separate trees. Three of them were found on the lateral branches of sapling trees, and the fourth on a small branch of an older tree. Young larvae commenced to appear on June 23rd.

Lecanopsis longicornis Green.

This species was described from three examples taken in 1915. In the following year (July 1916) the insect was found in comparative abundance, upon *Carex ovalis*, in damp meadows on the outskirts of Camberley. In its later development it constructs a cylindrical white ovisac, which readily becomes detached from its support and falls to the ground, where it is protected by the surrounding herbage. Young larvae were emerging from the ovisacs on July 18th.

Lecanopsis butleri, n. sp.

Adult female (fig. 4, *a*) elongate-ovate, without stigmatic clefts or indentations; flattish at first, afterwards somewhat convex dorsally. Colour light testaceous, paler on venter; at first of a uniform tint, but older examples show two fuscous longitudinal streaks extending the whole length of the insect. Antennae rather small; 5- to 7-jointed (fig. 4, *b, c, d, e*); the joints irregular in size and form, often showing deep constrictions suggesting the confluence

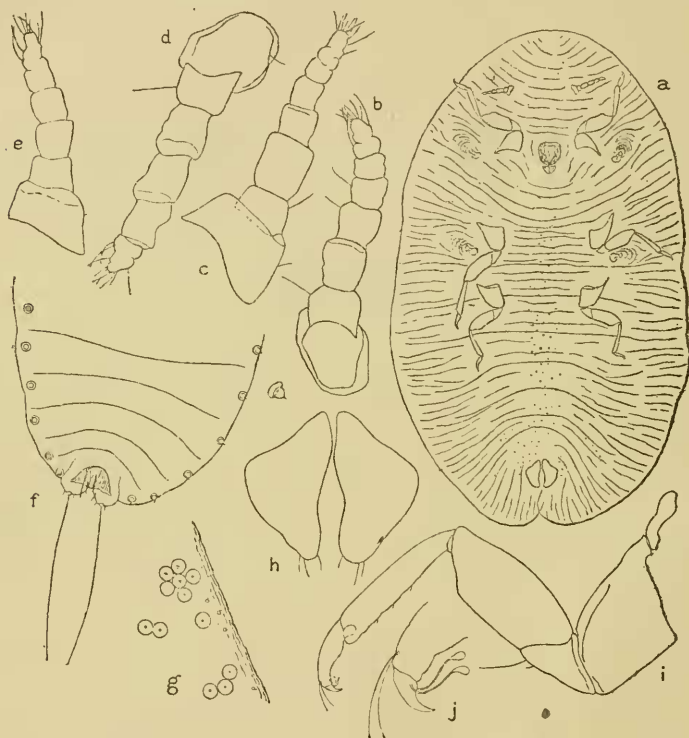


Fig. 4.—*Lecanopsis butleri*: *a*, adult female, opt. sect., $\times 14.4$; *b-e*, various forms of the antennae, $\times 104$; *f*, abdominal extremity of young larva, $\times 176$; *g*, thoracic margin of larva, $\times 360$; *h*, anal operculum of adult female, $\times 104$; *i*, mid leg, $\times 64$; *j*, foot, $\times 224$.

of two or more joints; the terminal joint with from 8 to 10 stout hairs towards its apex. Legs moderately stout; almost hairless (fig. 4, *i*); the tarsus strongly curved, less than half the length of the tibia; tarsal digitules slender, minutely knobbed at extremity; unguinal digitules broadly dilated distally (fig. 4, *j*); claw strongly falcate. The limbs of examples from Royston Heath are rather smaller than those of the Camberley specimens. Spiracles large and conspicuous, surrounded by a densely chitinous area and irregularly concentric folds, and with a scattered trail of ceriferous pores extending towards the margin of the insect. Some larger pores are disposed around the genital

orifice and in a medio-longitudinal series on the dorsum. Anal cleft short, about one-tenth the length of the body. The whole dorsum is thrown into delicate transverse folds, and the median area of the venter has a roughened shagreen-like surface. There are sparsely scattered pores and minute setae on the dorsum, but there are no specialized marginal hairs or spines, and no stigmatic spines.

Length 3.75-4.5, breadth 2-3 mm.; average of nine examples 4×2.42 mm.

Newly hatched larva elongate-ovate; pinkish ochreous. Antenna 6-jointed. Abdomen (fig. 4, *f*) with a marginal series of what at first appear to be large ring-shaped pores, but which, when viewed in profile, are seen to consist of an aculeate cupula-shaped spine on a ring-shaped base. Margin of thorax (fig. 4, *g*) with groups of large circular pores which vary in number and position. Posterior extremity with prominent rounded lobes (each bearing a long seta) which differ in form and structure from the same parts in most Lecaniid larvae.

Length 0.5 mm.

This new species was first brought to my notice by Mr. E. A. Butler, who swept it from grass, at Royston Heath, Herts, on Whit Monday (May 28th, 1917). Mr. Butler reports that the insects seemed to be fairly common on one part of the heath. He remarks that, although he has swept over the same part of the heath on many previous Whit Mondays, he has never noticed the insect before. These examples, though apparently adult, were not quite fully grown.

Subsequently, on June 22nd of the same year, Professor Newstead and I discovered fully mature examples, with ovisacs, at Camberley. The ovisacs, which are of a loose silky composition and of a more or less globular form, were full of rosy-pink eggs, each measuring 0.4 mm. in length. The parent insects remained attached to the ovisacs, partly entangled in the structure; they were mostly dead—distended by the attacks of Chalcid parasites, which subsequently emerged in considerable numbers. The ovisacs were found low down at the base of the tufts of grass, usually underneath a growth of moss that covers the ground between the plants. Young larvae commenced to emerge on July 5th.

It is probable, from the circumstances of their discovery, that the insects—for a short period before oviposition—ascend towards the top of the plants. The fact that they had not been observed by Mr. Butler, on his previous visits to the locality, may perhaps be accounted for by such visits not having exactly coincided with this period. I have much pleasure in naming this interesting species after its original discoverer.

Parafairmairia gracilis Green.

Examples taken on July 14th of the present year had only just commenced the secretion of the covering scale, which was still quite

transparent, completely revealing the castaneous colour of the insect. I have still been unable to determine the exact food-plant of the species, as the herbage (consisting of grasses and sedges) upon which it occurs is so closely intermingled; but I believe that it more particularly affects various species of *Carex*.

Eriopeltis festucae Fonscol.

Neither Signoret nor Newstead has described the male puparium of this species, though the former figures it—on a very small scale. I have found examples on the upper surface of the leaves of *Festuca*, in close proximity to the female sacs. The puparium is elongate, with rounded extremities; of a granulate, semi-transparent, glassy texture, with a slight indication of a medio-longitudinal carina; a large operculum covering the hinder extremity, but without other subdivisions. Length 1·75, breadth approximately 0·5 mm.

Luzulaspis luzulae Dufour.

This species occurs, at Camberley, on *Carex ovalis*, in addition to its normal food-plant (*Luzula*). Newstead states that “the eggs remain throughout the winter in the ovisac, the larvae hatching in spring.” This is probably the normal condition; but a few larvae have hatched out, in my laboratory, in the middle of July, from freshly constructed ovisacs taken early in the same month. There is possibly a partial second brood, while the bulk of the eggs remain as such through the winter. The newly hatched larvae already have the stout stigmatic spines strongly developed.

Ceroplastes rusci L.

Examples of this beautiful little species have been sent to me, on the fruit of green figs imported from Italy. Though it cannot be regarded as an indigenous British Coccid, it is in the same category with *Parlatoria zizyphi* and *Lepidosaphes citricola*, which are included in the British list on the strength of their occurrence upon imported fruit in our markets.

Way's End, Camberley.

August 5th, 1917.

A note on Rhizotrogus ochraceus Knoch.—Dr. Sharp informs me that some doubt is supposed to exist as to the specific distinctness of this insect from *R. solstitialis* L. For many years I have been well acquainted with both species, which occur in a part of north Cornwall frequently